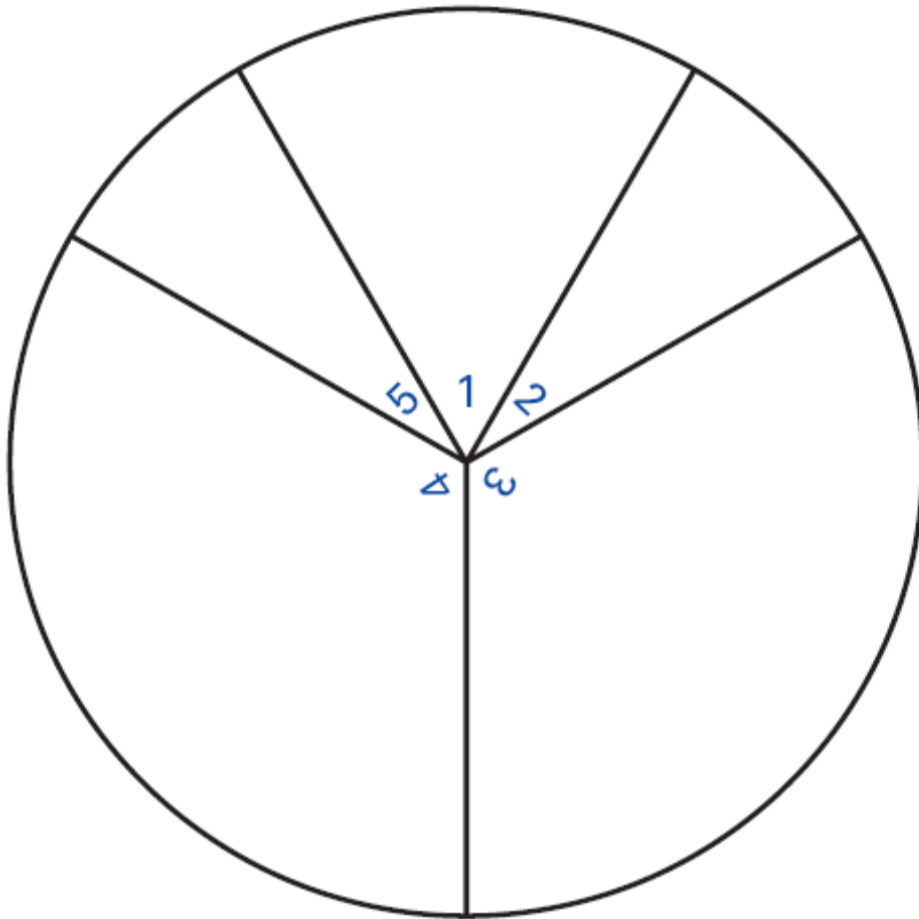


Geometry Date _____
(pp 109-112)

2.6 Notes: Proving Statements about Angles



Geometry Date_____
(pp 109-112)

2.6 Notes: Proving Statements about Angles

A. Cut out the circle. Cut the circle along the lines, so that you have five angles.

B. Place $\angle 1$ so that its vertex is at the corner of your paper. Use the fact that the corner is a right angle to find an angle that is complementary to $\angle 1$.

C. Find a different angle that is complementary to $\angle 1$. How does this angle compare to the angle you found in Question B?

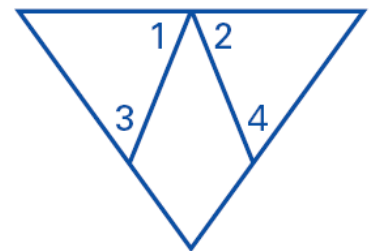
D. Place $\angle 1$ so that one of its sides lies along the edge of your paper. Find an angle that is supplementary to $\angle 1$.

E. Find a different angle that is supplementary to $\angle 1$. How does this angle compare to the angle you found in Question D?

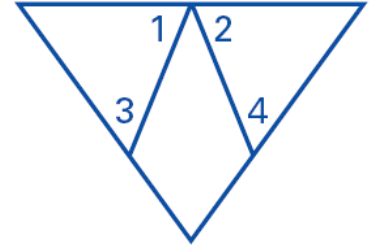
Definition of Congruent angles:

Examples.

1. **Given:** $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$, $\angle 2 \cong m\angle 3$
Prove: $\angle 1 \cong \angle 4$



2. **Given:** $m\angle 1 = 63^\circ$, $\angle 1 \cong \angle 3$, $\angle 3 \cong \angle 4$
Prove: $m\angle 4 = 63^\circ$



THEOREM

THEOREM 2.3 *Right Angle Congruence Theorem*

All right angles are congruent.

3. Example.

Given: $\angle 1$ & $\angle 2$ are right angles

Prove: $\angle 1 \cong \angle 2$

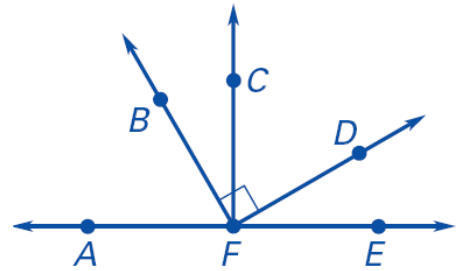


4. Guided Practice.

Given: $\angle AFC$ & $\angle BFD$ are right angles.

$$\angle BFD \cong \angle CFE$$

Prove: $\angle AFC \cong \angle CFE$

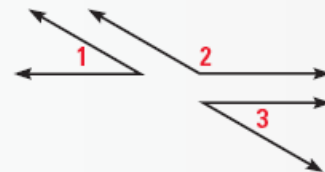


THEOREMS

THEOREM 2.4 *Congruent Supplements Theorem*

If two angles are supplementary to the same angle (or to congruent angles) then they are congruent.

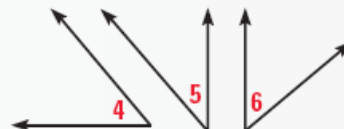
$$\text{If } m\angle 1 + m\angle 2 = 180^\circ \text{ and } m\angle 2 + m\angle 3 = 180^\circ, \text{ then } \angle 1 \cong \angle 3.$$



THEOREM 2.5 *Congruent Complements Theorem*

If two angles are complementary to the same angle (or to congruent angles) then the two angles are congruent.

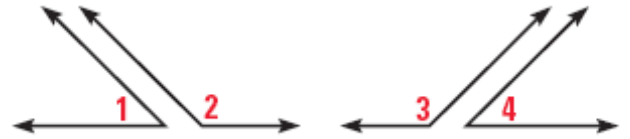
$$\text{If } m\angle 4 + m\angle 5 = 90^\circ \text{ and } m\angle 5 + m\angle 6 = 90^\circ, \text{ then } \angle 4 \cong \angle 6.$$



5. Example.

Given: $\angle 1$ & $\angle 2$ are supplements. $\angle 2$ & $\angle 3$ are supplements. $\angle 1 \cong \angle 4$

Prove: $\angle 1 \cong \angle 3$

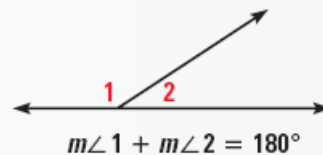


6. Guided Practice: In a diagram, $\angle 1$ & $\angle 2$ are supplementary and $\angle 2$ & $\angle 3$ are supplementary. Explain how show that $\angle 1 \cong \angle 3$.

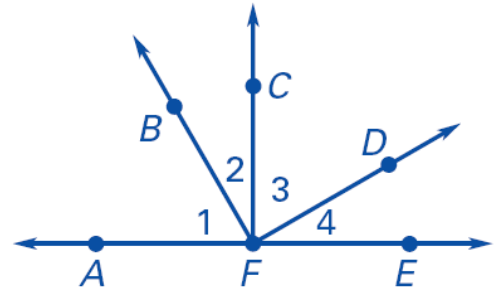
POSTULATE

POSTULATE 12 *Linear Pair Postulate*

If two angles form a linear pair,
then they are supplementary.



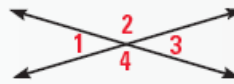
7. Example. In the diagram $m\angle 1 = 60^\circ$ and $\angle BFD$ is a right angle. Explain how to show that $m\angle 4 = 30^\circ$.



THEOREM

THEOREM 2.6 *Vertical Angles Theorem*

Vertical angles are congruent.

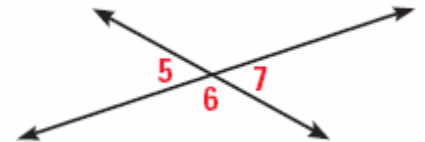


$$\angle 1 \cong \angle 3, \angle 2 \cong \angle 4$$

8. Example

Given: $\angle 5$ & $\angle 6$ are a linear pair. $\angle 6$ & $\angle 7$ are a linear pair.

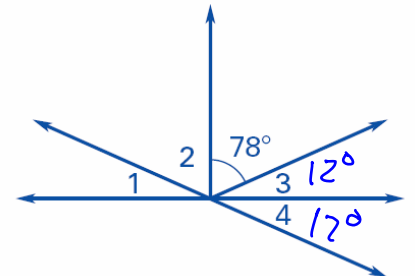
Prove: $\angle 5 \cong \angle 7$



Guided Practice.

9. Find the measures of the angle in the diagram given

$\angle 1$ & $\angle 2$ are complementary and $\angle 1 \cong \angle 3 \cong \angle 4$.



10. "If $\angle CDE \cong$ _____ and $\angle QRS \cong \angle XYZ$, then $\angle CDE \cong \angle XYZ$," is an example of the _____ Property of Angle Congruence.

11. To close the blades of the scissors, you close the handles. Will the angle formed by the blades be the same as the angle formed by the handles? Explain.

